

Message

From: Vulimiri, Suryanarayana [Vulimiri.Sury@epa.gov]
Sent: 11/30/2017 2:14:06 PM
To: Bussard, David [Bussard.David@epa.gov]; Kraft, Andrew [Kraft.Andrew@epa.gov]; Glenn, Barbara [Glenn.Barbara@epa.gov]; Ramasamy, Santhini [Ramasamy.Santhini@epa.gov]; Subramaniam, Ravi [Subramaniam.Ravi@epa.gov]
Subject: RE: Hot off the press on Endogenous Formaldehyde
Flag: Follow up

Sure David. I will get on to it right away and get back to you soon.
Sury

From: Bussard, David
Sent: Thursday, November 30, 2017 9:09 AM
To: Vulimiri, Suryanarayana <Vulimiri.Sury@epa.gov>; Kraft, Andrew <Kraft.Andrew@epa.gov>; Glenn, Barbara <Glenn.Barbara@epa.gov>; Ramasamy, Santhini <Ramasamy.Santhini@epa.gov>; Subramaniam, Ravi <Subramaniam.Ravi@epa.gov>
Subject: RE: Hot off the press on Endogenous Formaldehyde

Sury,

Actually, any chance you can give this more urgency? At least if we think something should be added to the draft assessment? Andrew and Barbara are trying to finish up a draft we can send into Agency review. If they are going to add something this round, they'll need text very soon. And, if the IOAA asks about this paper, we'll need an answer soon.

Ex. 5 Deliberative Process (DP)

David

From: Vulimiri, Suryanarayana

Sent: Thursday, November 30, 2017 8:48 AM

To: Bussard, David <Bussard.David@epa.gov>; Kraft, Andrew <Kraft.Andrew@epa.gov>; Glenn, Barbara <Glenn.Barbara@epa.gov>; Ramasamy, Santhini <Ramasamy.Santhini@epa.gov>

Subject: RE: Hot off the press on Endogenous Formaldehyde

David,

Ex. 5 Deliberative Process (DP)

Sury

Sury Vulimiri, Ph.D., DABT National Center for Environmental Assessment, Office of Research & Development, US EPA.
Phone: 919-541-3558 | Fax: 919-541-0245 | vulimiri.sury@epa.gov

From: Bussard, David

Sent: Wednesday, November 29, 2017 5:54 PM

To: Kraft, Andrew <Kraft.Andrew@epa.gov>; Glenn, Barbara <Glenn.Barbara@epa.gov>; Ramasamy, Santhini <Ramasamy.Santhini@epa.gov>; Vulimiri, Suryanarayana <Vulimiri.Sury@epa.gov>

Subject: Fwd: Hot off the press on Endogenous Formaldehyde

Thanks Sury.

Ex. 5 Deliberative Process (DP)

David Bussard

Begin forwarded message:

From: "Vulimiri, Suryanarayana" <Vulimiri.Sury@epa.gov>

Date: November 29, 2017 at 5:39:41 PM EST

To: "Bussard, David" <Bussard.David@epa.gov>

Subject: RE: Hot off the press on Endogenous Formaldehyde

David, that is the question I have. It needs some collective thinking into it. Here are some preliminary thoughts.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Sury

Sury Vulimiri, Ph.D., DABT National Center for Environmental Assessment, Office of Research & Development, US EPA. Phone: 919-541-3558 | Fax: 919-541-0245 | vulimiri.sury@epa.gov

From: Bussard, David
Sent: Wednesday, November 29, 2017 5:06 PM
To: Vulimiri, Suryanarayana <Vulimiri.Sury@epa.gov>
Subject: RE: Hot off the press on Endogenous Formaldehyde

Thanks Sury

Ex. 5 Deliberative Process (DP)

David

From: Vulimiri, Suryanarayana
Sent: Wednesday, November 29, 2017 4:43 PM
To: Bateson, Thomas <Bateson.Thomas@epa.gov>; Glenn, Barbara <Glenn.Barbara@epa.gov>; Fritz, Jason <Fritz.Jason@epa.gov>; Kraft, Andrew <Kraft.Andrew@epa.gov>; Makris, Susan <Makris.Susan@epa.gov>; Segal, Deborah <Segal.Deborah@epa.gov>; Subramaniam, Ravi <Subramaniam.Ravi@epa.gov>; Vulimiri, Suryanarayana <Vulimiri.Sury@epa.gov>; Whalan, John <Whalan.John@epa.gov>
Cc: Bussard, David <Bussard.David@epa.gov>; Ramasamy, Santhini <Ramasamy.Santhini@epa.gov>
Subject: Hot off the press on Endogenous Formaldehyde

Mammals divert endogenous genotoxic formaldehyde into one-carbon metabolism.

Burgos-Barragan G¹, Wit N¹, Meiser J¹, Dingler FA¹, Pietzke M², Mulderrig L¹, Pontel LB¹, Rosado IV³, Brewer TF⁴, Cordell RL⁴, Monks PS⁵, Chang CJ⁴, Vazquez A³, Patel KJ^{1,6}.

Author information

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Abstract

The folate-driven one-carbon (1C) cycle is a fundamental metabolic hub in cells that enables the synthesis of nucleotides and amino acids and epigenetic modifications. This cycle might also release formaldehyde, a potent protein and DNA crosslinking agent that organisms produce in substantial quantities. Here we show that supplementation with tetrahydrofolate, the essential cofactor of this cycle, and other oxidation-prone folate derivatives kills human, mouse and chicken cells that cannot detoxify formaldehyde or that lack DNA crosslink repair. Notably, formaldehyde is generated from oxidative decomposition of the folate backbone. Furthermore, we find that formaldehyde detoxification in human cells generates formate, and thereby promotes nucleotide synthesis. This supply of 1C units is sufficient to sustain the growth of cells that are unable to use serine, which is the predominant source of 1C units. These findings identify an unexpected source of formaldehyde and, more generally, indicate that the detoxification of this ubiquitous endogenous genotoxin creates a benign 1C unit that can sustain essential metabolism.

PMID:

28813411

DOI:

10.1038/nature23481

<< File: Burgos-Barragan et al 2017_EndogenousFA.pdf >> << File: Pontel et al 2015_SV.pdf >>

So the bottom line is that endogenous formaldehyde is safely handled by the cells diverting it into normal cellular metabolism. This is published in Nature (PDF attached).

Ex. 5 Deliberative Process (DP)

Sury

Sury Vulimiri, Ph.D., DABT National Center for Environmental Assessment, Office of Research & Development, US EPA. Phone: 919-541-3558 | Fax: 919-541-0245 | vulimiri.sury@epa.gov